

AT&T/WorldCom's attempt to correct their line count forecast (by removing 700,000 DS0 equivalents) in response to Verizon VA's criticisms (Tr. at 4297) does not fix the underlying problem of trying to use the MSM to model the costs of UNEs that simply cannot be provided over the narrowband network. As explained above, the use of *any* high capacity DS0 equivalents in the MSM's loop module exaggerates scale economies in the narrowband network, because the MSM treats those equivalents as additional narrowband demand at existing business customer locations. This necessarily underestimates the cost of providing *all* loop UNEs in Virginia.

In addition to creating scale economies that do not exist, Mr. Pitkin's forecasted line counts create other errors in the MSM that lead to a network that cannot physically serve Verizon VA's customers. For example, the MSM produces an average cable drop length of only 27 feet, effectively guaranteeing that numerous housing units and business locations could not be physically connected to the network. (VZ-VA Ex. 142; AT&T/WCom Ex. 122 at 12-8 (identifying the average working pair, *as opposed to per-location*, drop length as 73 feet).) This average drop length is less than half of the average drop length per working line produced using the default inputs and less than half of that produced by the HAI Model filed by AT&T in the ongoing Massachusetts UNE proceeding.^{161/} (VZ-VA Ex. 109 at 105.)

^{161/} One of the principle reasons the MSM is incapable of accurately calculating a sufficient amount of drop length is because the MSM models a fixed drop investment per foot to a hypothetical, static number of customer locations. As a result, when AT&T/WorldCom inflate the number of lines, but the number of customer locations does not increase, the total drop investment virtually does not change. Indeed, as Dr. Tardiff stated, because the Model "measures where the drop might be with respect to where *hypothetically* the network equipment is placed or [where *hypothetically*] customer locations are located," the MSM does not calculate an adequate quantity of drop. (Tr. at 4355-56 (emphasis added).) The MSM's failure to produce additional drop investment demonstrates, yet again, that the MSM's assumptions are even internally inconsistent and invalid.

Mr. Pitkin's forecasted line counts also cause the MSM to produce overall feeder lengths that are inefficiently short and distribution lengths that are impossibly small. Efficient engineering practices call for maximizing the length of feeder facilities in the local loop and reducing the length of more costly and less highly utilized distribution facilities. (VZ-VA Ex. 109 at 24.) With Mr. Pitkin's forecasted line counts, the MSM models a network that ignores this widely-accepted practice and contains an unrealistically small amount of feeder facilities. Although in the real world, shorter feeder facilities obviously require longer distribution facilities, the MSM ignores this necessity and produces impossibly undersized distribution facilities when using Mr. Pitkin's forecasted line counts. (VZ-VA Ex. 109 at 24-25.) The MSM produces distribution lengths that are, in some instances, less than the *minimum* distance between the customer being connected and the Verizon VA central office.^{162/} (VZ-VA Ex. 108 at 45.) These impossibly short distribution cable lengths result in understated distribution cable investment, support structure investments (*e.g.*, poles, manholes, trenches, conduits, and pull boxes), and maintenance costs, to name but a few. But more important, the understatement of both feeder and distribution produce a network that simply is not designed to be able to actually reach and serve the customers it is required to serve.

The problems associated with Mr. Pitkin's line counts are only exacerbated by his failure to augment the customer locations in the modeled network to accommodate his inflated line counts. Mr. Pitkin relies on projected 2002 line counts, yet assumes that these increased lines

^{162/} In his surrebuttal testimony, Mr. Pitkin attempts to make the MSM's distances appear reasonable by inappropriately adding drop distances to distribution distances. (AT&T/WCom Ex. 14 at 39.) Adding drop distances is only appropriate when customer locations are set back from roads (*see* AT&T and MCI *Ex Parte*, CC Docket No. 96-45, "HAI Model v.5.0a, Why It Engineers the Appropriate Amount of Distribution Plant," at 17-18 (June 10, 1998)), which is not the case for the customer location data used in the MSM.

will be provisioned to the number of customer locations present in 1997. As a result, every additional line is assumed to be a second line, producing a wholly unrealistic and completely unsubstantiated rate of secondary line growth.^{163/} (Tr. at 4401-02 (Murphy); VZ-VA Ex. 109 at 116-117; VZ-VA Ex. 108 at 30.) In addition, because the customer locations modeled remain static, an increase in lines results in an unrealistic increase in the amount of shared resources and unattainable economies of scale.

Short of reprogramming the MSM to account properly for all of the specific facilities and electronics needed to provision high capacity services, the only solution to these problems is to remove the DS0 equivalents representing high capacity services from the projected line counts used in the MSM. Indeed, removing the high capacity DS0 equivalents causes the MSM to model a network with more reasonable route lengths, as Mr. Gansert noted during the hearing. (Tr. at 4350.) Notably, however, correcting this error would leave the MSM even less capable of calculating the TELRIC costs of providing high capacity services. (Tr. at 4133-34 (Murphy); VZ-VA Ex. 109 at 29-38.)

2. The Modified Synthesis Model's Structure Sharing Inputs Are Based upon Unrealistic Efficiencies and Assume Sharing Opportunities That Could Never Be Realized in the Real World.

The Modified Synthesis Model's structure sharing inputs are based on efficiencies that, as described in detail above in Part IV, are unattainable in practice. As noted above, Petitioners ignored Verizon VA's structure sharing experience in Virginia and rejected even the Commission's nationwide sharing values. Instead, Petitioners propose inputs that reflect wholly unrealistic amounts of structure sharing based on their view of what the future might be like — a

^{163/} In fact, compared to the Synthesis Model, the MSM increases secondary residential lines by 240,409, but *decreases* primary lines by 19,318. (VZ-VA Ex. 109 at 117 (Table 6).)

future in which *all* networks, including those of all utility and cable service providers, are rebuilt simultaneously, so that each of these entities would be ready and willing to share structure costs with the MSM's hypothetical new entrant. (*See* Tr. at 3225 (Tardiff).) The MSM thus fails to reflect the variety of real-world factors that limit sharing opportunities for Verizon VA and other efficient, real-world carriers. (VZ-VA Ex. 109 at 96.)

For example, despite the fact that there are very few actual conduit trench sharing opportunities in Virginia,^{164/} AT&T/WorldCom arbitrarily propose a conduit sharing factor of 50%. (AT&T/WCom Ex. 12 at 78.) But, as Mr. Gansert explained, a third party would be “irrational” to share Verizon VA’s cost of placing conduit, because most third parties are already entitled to lease spare ducts from Verizon VA at heavily discounted rates that are far less than a proportionate share of the true structure placement costs. (Tr. at 4387.) Petitioners have no answer for this, nor any explicable reason why, even in the hypothetical future world they envision, Verizon VA or any carrier would expect to enjoy more sharing than Verizon VA has in the past. Certainly sharing — which reduces costs — is something that Verizon VA would always have had an incentive to pursue, if such opportunities in fact existed.

AT&T/WorldCom’s proposed structure sharing factor of 33% for all buried cable (*i.e.*, assuming that Verizon VA is responsible for only 33% of the cost) is similarly unjustifiable. It ignores the FCC’s default values for buried cable structure sharing (which range from 55% to 100%) and Verizon VA’s actual underground cable investment data, which already reflect Verizon VA’s achieved sharing opportunities. (*See* AT&T/WCom Ex. 23, Attachment G at 14;

^{164/} *See* VZ-VA Ex. 122 at 146 (noting “only limited opportunities to share trenching costs” in Virginia); Tr. at 4382-83 (Murphy) (noting that Verizon VA’s cost studies attributed 97% of conduit investment to Verizon because there is “virtually no [current] sharing of conduit systems”).

VZ-VA Ex. 109 at 97; VZ-VA Ex. 122 at 146; Tr. at 4380 (Gansert); *see also Tenth Report and Order* at 20260-61 ¶ 243.) AT&T/WorldCom further increase their already inflated inputs for feeder structure sharing (which in turn reduces feeder structure investment within the model) by an additional 40% based on the completely speculative assumption that in the Virginia network, 40% of all feeder routes would or should share structure with distribution cable. (AT&T/WCom Ex. 1 at 19; AT&T/WCom Ex. 6 at 11-12.) AT&T/WorldCom provide no evidence in support of these proposed inputs, and their witness Mr. Riolo conceded that he did not even know whether AT&T or WorldCom experienced the level of structure sharing opportunities that he postulated.^{165/} (Tr. at 4547.)

The Commission already has rejected AT&T/WorldCom's proposed structure sharing changes and should do so again.^{166/} These changes are based on nothing more than the unsubstantiated speculation of AT&T/WorldCom's witnesses and the HAI Model developers. (See VZ-VA Ex. 109 at 95; AT&T/WCom Ex. 18 at 15-18; AT&T/WCom Ex. 12 at 76-78.) Indeed, as Verizon VA explained above, AT&T/WorldCom's proposed structure sharing inputs reflect wholly unrealistic assumptions about achievable structure sharing opportunities. Inexplicably, the MSM assumes that conduit and manholes can be shared with other utilities.^{167/} Compounding these significant modeling flaws is the MSM's failure to account for either the costs of the structure necessary to accommodate the sharing of facilities with other utilities, or

^{165/} One day before the filing of this brief, Petitioners still had not responded to the Commission's record request concerning the extent to which Petitioners had experienced structure sharing opportunities.

^{166/} See *Tenth Report and Order* at 104, ¶ 241.

^{167/} In contrast, the HAI Model documentation, Appendix B - Structure Shares Assigned to Incumbent Local Telephone Companies, notes that sharing is appropriate only for trenches, not for conduit or manholes. (See also VZ-VA Ex. 107 at 78-79.)

the costs of building structures that reflect the operating realities in Virginia. (See VZ-VA Ex. 109 at 94-96.) In the end, as noted above, AT&T/WorldCom's changes just to the Commission's default structure sharing assumptions (which themselves are too high) have the effect of reducing the total plant investment by \$292 million and the statewide average loop cost by \$0.92. (VZ-VA Ex. 109 at 95; VZ-VA Ex. 142; VZ-VA Ex. 204.)

3. The Modified Synthesis Model Assumes a Plant Mix That Is Completely Arbitrary and Would Never Exist in the Real World.

The MSM arbitrarily assumes a plant mix that cannot be achieved in Virginia on a forward-looking basis. By assuming away the constraints faced by providers operating in the real world, and incorporating unrealistic amounts of structure types the costs of which Petitioners have artificially deflated, AT&T/WorldCom have manipulated the MSM to lower its already understated outside plant cost estimates. What AT&T/WorldCom lose in the process, however, is any connection to reality. It should come as no surprise that AT&T/WorldCom's unjustified "modifications" to the Commission's default plant mix inputs reduce plant investment by \$291 million and decrease the Synthesis Model's loop costs by \$0.54. (VZ-VA Ex. 142.) Had Petitioners used Verizon VA's plant mix assumptions, the monthly statewide average loop cost would have increased by \$0.91. (VZ-VA Ex. 204.)

Paramount among the problems associated with the Modified Synthesis Model's unrealistic plant mix assumptions is the failure to take into account, on an area-specific basis, factors such as existing structures, municipal ordinance requirements, the specific location of rights-of-way, potential roadside hazards, local weather, and the fact that other facilities may already use particular types of structure in an area where new cable is being placed. (VZ-VA Ex. 109 at 109.) All of these factors are critical to determining the appropriate structure type in a particular area and, hence, the proper mix of outside plant. Instead of taking these factors into

account, AT&T/WorldCom claim, without any explanation or empirical analysis, to have “transformed” statewide ARMIS data into plant mix values that vary by density zone. (AT&T/WCom Ex. 6 at 40.) This overly simplistic approach does not, and could not, be expected to result in meaningful estimates of the specific structures that are necessary to serve the over 3.7 million narrowband lines in Verizon VA’s territory.

AT&T/WorldCom’s inputs reflect unrealistic assumptions concerning the types of facilities that would be deployed throughout the hypothetical network. For example, the MSM substantially understates the amount of underground facilities that could reasonably be expected to exist in Virginia. This understatement is not surprising given that underground facilities are the most expensive to install,^{168/} but it ignores the fact that underground cable must be used in certain locations (such as under busy streets) to avoid the need for repeated excavations.

Finally, the dominant structure type in the network Petitioner’s model — buried cable^{169/} — is the structure type for which they posit the most sharing. The MSM assumes a buried cable sharing factor of 33%, which assumes three-way sharing of trenches throughout Virginia. (AT&T/WCom Ex. 12 at 77-78.) This assumption reduces the costs of buried cable to an implausible level.^{170/} AT&T/WorldCom’s speculative and unsupported plant mix inputs (assuming 40-50% buried cable), working in tandem with their wholly unrealistic structure

^{168/} The costs associated with underground facilities include costs for excavation, restoration, and structure such as conduits and manholes. (VZ-VA Ex. 107 at 28, 79.)

^{169/} Buried cable accounts for more than half of all distribution and copper feeder cable and 40% of all fiber feeder in six of the MSM’s nine density zones. (AT&T/WCom Ex. 14, Accompanying Workpapers at file “VA_Direct_Inputs.xls,” at tabs “DISTRMIX,” “CuFDRMIX,” and “FiFDRMIX.”)

^{170/} Furthermore, in making the changes for buried structure sharing, Mr. Riolo makes no attempt to adjust the values to reflect lower sharing opportunities with buried feeder structure, consistent with the HAI Model values upon which he relied. (VZ-VA Ex. 109 at 95.)

sharing inputs (with Verizon VA responsible for only one-third of the cost of burying the cable), further understate the MSM's loop cost estimates and should be rejected. In reality, no carrier, no matter how forward-looking the environment, would be able to operate efficiently, if at all, utilizing the plant mix produced by the MSM.

4. AT&T/WorldCom's Proposed Fill Factors in the MSM Are Unreasonably High.

AT&T/WorldCom's proposed target fill factors in the MSM would not allow Verizon VA or any other carrier to operate a network efficiently and meet the service quality standards imposed by the Virginia Commission. As explained above in Part IV, an efficient local exchange network must be designed to include sufficient amounts of spare capacity to accommodate administrative and maintenance needs, demand fluctuations, and, for some types of plant, future growth. Moreover, the realities of operating a real network produce additional spare capacity. For example, accepted planning standards and guidelines for building efficient distribution facilities require building two or more pairs per subscriber location to provide the requisite capacity to service the demand. (*See, e.g.*, VZ-VA Ex. 109 at 21-22.) The MSM's target fill factors fail to take these considerations into account, and, as a result, model a network that could not be operated efficiently, if at all.

The most egregious examples of AT&T/WorldCom's unreasonably high proposed fill factors are for fiber strand and distribution cable.^{171/} For fiber strand, as noted in Part IV, AT&T/WorldCom use a 100% fill factor. As Mr. Gansert explained during the hearing, it "just patently defies common sense" to assume that it would even be possible, much less efficient, to

^{171/} The MSM is unable to provide the requisite information to determine its effective fill factors in the first instance. (Tr. at 4190 (Tardiff).) To overcome this inherent shortcoming, AT&T/WorldCom offer a dubious fill factor calculation based on the number of working lines.

build a fiber network that was sized perfectly to meet all demand, now and forever, with no spare fibers available for any purposes. (Tr. at 4502.)

Petitioners' proposed distribution fill factor is not much better. Though AT&T/WorldCom claim that their target fill factor for distribution produces an actual fill of 52.5%, Mr. Pitkin's calculation of that number was based upon an incorrect ratio of mid-2001 working lines to the end-of-year 2002 capacity he estimates that the MSM produces.^{172/} (AT&T/WCom Ex. 14 at 14 n.15.) The correct comparison of line counts and capacity at the same point in time would produce a fill factor of 64.3%. Further, given the way in which Petitioners calculate fill factors based on Mr. Pitkin's line counts, if line counts are assumed to continue to grow at the rate that Mr. Pitkin suggests,^{173/} then the static network modeled by the MSM would have to operate with a distribution fill factor of almost 100% in 2004 and would overload in 2005. (VZ-VA Ex. 108 at 29.)

The other fill factors proposed by AT&T/WorldCom also fail to provide for reasonable levels of spare capacity that would exist in an efficiently designed and operated forward-looking network for all of the reasons discussed in Part IV above. Indeed, Mr. Riolo acknowledged that he was unaware of *any* local exchange network that operates at the levels of AT&T/WorldCom's proposed fills. (Tr. at 4513-15.)

^{172/} Mr. Pitkin's surrebuttal testimony identifies the capacity produced by the Model and the 2001 lines counts. (AT&T/WCom Ex. 14 at 16.) The 2002 line counts used in Mr. Pitkin's direct testimony are identified in Attachment H to the July 2, 2001 cost study filing. (AT&T/WCom Ex. 23.)

^{173/} Using Mr. Pitkin's forecasted growth rates, the MSM would have to serve a projected 10.2 million access lines in 2004. (VZ-VA Ex. 108 at 29.)

5. AT&T/WorldCom Use Understated and Unverified Investment Inputs in the MSM's Loop Module.

AT&T/WorldCom use numerous understated investment inputs in the MSM's loop module, contributing to the MSM's understatement of the TELRIC costs for loops. For example, AT&T/WorldCom propose a per pole investment of approximately \$417 but provide absolutely no data showing that value to be reasonable in any jurisdiction, much less in Virginia. (VZ-VA Ex. 108 at 42.) Indeed, Verizon VA's extensive experience installing poles in Virginia shows that the actual investment (in current dollars) per pole is 217% greater than that produced by the MSM. (VZ-VA Ex. 108 at 41-42.)

Similarly, AT&T/WorldCom propose DLC investment inputs that are significantly lower than the Commission's default DLC hardware inputs — values that were at least based on empirical average data compiled by the Commission. The sole basis for Petitioners' proposed DLC inputs is Mr. Riolo's unsubstantiated opinion. (AT&T/WCom Ex. 6 at 19-20.) Without factual documentation, however, relying on Mr. Riolo's judgment is wholly inappropriate, particularly given that AT&T/WorldCom have been provided Verizon VA's current, highly discounted DLC costs that reflect the benefits of Verizon VA's substantial purchasing power.^{174/} AT&T/WorldCom's significant, unjustified reduction to the Commission's default DLC hardware inputs reduces outside plant investment by \$78.3 million and depresses loop costs by \$0.25, as compared to the original Synthesis Model's values. (VZ-VA Ex. 109 at 14; VZ-VA

^{174/} Mr. Riolo's attempt in his Surrebuttal Testimony to compare his proposed DLC inputs to Verizon's DLC contract prices (AT&T/WCom Ex. 18 at 13-14) is misleading. As Mr. Riolo acknowledges in his Direct Testimony, his DLC investment inputs are intended to include installation costs. (AT&T/WCom Ex. 6 at 19-20.) Verizon's DLC contract prices, by contrast, are materials-only prices that do not include any installation costs.

Ex. 142.) And importing Verizon's DLC prices into the MSM increases the monthly statewide average loop cost by \$0.39. (VZ-VA Ex. 204.)

Moreover, when they do rely on the Synthesis Model's default inputs, AT&T/WorldCom manage to pick low-cost inputs even when the facts demonstrate that those inputs are unreasonable. For example, AT&T/WorldCom conveniently forego using *less* current values for those costs of loop components that have been increasing over time — *e.g.*, copper cable, labor, and outside plant structure. (VZ-VA Ex. 109 at 81-82; VZ-VA Ex. 108 at 43.) Instead, AT&T/WorldCom use the default input prices for these assets, which are based on 1997 nationwide levels, thereby understating the forward-looking costs of those loop components. This “oversight” stands in stark contrast to their treatment of switching prices: while switching equipment prices generally have decreased over time, AT&T/WorldCom utilize more current switching costs (1999) when estimating these UNE rates. (See VZ-VA Ex. 109 at 80-81; *Tenth Report and Order* at 20412-15, Appendix C.) Ironically, WorldCom itself recognized in its brief before the Supreme Court that switching equipment is characterized by declining costs, “while loop costs are ‘increasing.’”^{175/}

AT&T/WorldCom also use an unreasonably low figure for power and main distribution frame investment, which has been rejected by the very company responsible for generating the data upon which the figure is based. Technology Futures Inc. has stated unequivocally that the Commission misapplied its study in adopting the Synthesis Model, and thus the actual investment for power and main distribution frames should be substantially higher than the estimates used in the MSM. (VZ-VA Ex. 163 at Attachment 4.) Although Petitioners claim to

^{175/} WorldCom Reply Brief at 6.

“correct” the Synthesis Model in other respects, they do not “correct” for this data, apparently because this correction would have caused the MSM’s cost estimates to increase.

6. The Modified Synthesis Model Uses Customer Location Data That Cannot Be Verified by the Commission or the Parties to this Proceeding and that Fails to Account for Vacant Customer Locations.

A critical factor in determining the cost of providing service is the location of the customers to be served. The customer location data used in the Modified Synthesis Model is based on proprietary pre-processing data and algorithms assembled and derived from a variety of source data by Taylor Nelson Sofres (“TNS”), the most recent of which is of 1997 vintage. (VZ-VA Ex. 109 at 116, 118.) TNS will not even allow the Commission, Verizon, AT&T/WorldCom, state commissions, or their consultants sufficient access to perform a meaningful review of the actual data or the processes TNS uses to convert the data into customer locations. Thus, it is difficult even to evaluate the logic of the customer locations used by Petitioners.

It is clear, however, that the MSM takes an unrealistic approach to building outside plant to customer locations. The MSM does not build outside plant to residential and business units that are vacant pending rental turnover, real estate transfer, or to known new construction sites.^{176/} (VZ-VA Ex. 109 at 23.) Yet clearly such locations are likely to need outside plant in the near if not immediate future. Assuming away the plant that would be necessary to serve them is entirely absurd and, in the real world, would be grossly inefficient. A network designed

^{176/} There is absolutely no quantitative or documented support for AT&T/WorldCom’s claim that the TNS data includes some unoccupied housing units (which are accounted for in Verizon’s model through its utilization factors) (VZ-VA Ex. 109 at 23 n.27, *see also Tenth Report and Order* at 20183-84 ¶¶ 56-57.). AT&T/WorldCom have not provided any record evidence to suggest that vacant housing units allegedly are included in the Metromail mailing list. In fact, it is highly unlikely that the Metromail database would send mailings to vacant customer locations.

in that way would be incapable of meeting the service quality standards mandated by the Virginia Commission (VZ-VA Ex. 109 at 25) and would not comply with the service standards and nondiscrimination principle established by the Commission in its *UNE Remand Order*^{177/} and *First Report and Order*,^{178/} respectively. For example, the inefficient plant designed by the MSM would not allow Verizon VA to meet the Virginia Commission's requirement that certain orders be completed within five working days, and would make it impossible for Verizon VA to comply with the Commission's requirement that ILECs provision UNEs under terms and conditions essentially equivalent to those under which the ILEC provisions to itself.

7. The Modified Synthesis Model's Unrealistic Engineering Assumptions Design a Network Incapable of Provisioning Unbundled, Fiber-Fed Loops.

The MSM's provisioning of fiber-fed DLC loops is based upon engineering feats that have not been achieved in the real world — a fact recognized by AT&T/WorldCom. (Tr. at 4619.) Although, as noted in Part IV above, the MSM actually uses more copper than Verizon VA's forward-looking model posits, where it does use fiber-fed DLC loops, the MSM assumes that those loops can be provisioned using the GR-303 integrated digital loop carrier ("IDLC") switch interface. (AT&T/WCom Ex. 6 at 19-20.) As explained in detail in Part IV above, this assumption simply does not accord with the reality of currently available — or even foreseeable — technology. And even if Verizon VA could somehow develop or purchase the necessary DLC equipment, OSS, and switch interfaces to support GR-303 loop unbundling, the MSM does

^{177/} Third Report and Order and Fourth Further Notice of Proposed Rulemaking, *In re Implementation of the Local Competition Provisions of the Telecommunications Act of 1996*, 15 FCC Rcd. 3696 (1999) ("*UNE Remand Order*").

^{178/} *Local Competition Order* at 15656 ¶ 307.

not include all of the costs Verizon VA would have to incur to develop and deploy those capabilities. (VZ-VA Ex. 109 at 27.)

8. The MSM's Failure to Adhere to Widely-Accepted Engineering Standards Produces Inaccurate and Unrealistic Outside Plant Cost Estimates.

The methodology used by the MSM to size distribution areas and locate customers in the network fails to adhere to recognized engineering standards. As a result, the MSM produces understated distribution investments and models a network that is incapable of providing required services. The MSM completely ignores well-established outside plant design principles, which typically size serving areas at 200 to 600 living units. (VZ-VA Ex. 109 at 28; VZ-VA Ex. 142.) The MSM's inefficient and inappropriate outside plant design causes the MSM to model a network in which 24.8% of the serving areas exceed 600 living units. (VZ-VA Ex. 109 at 28; VZ-VA Ex. 142.) Moreover, by relying on dubious and unproven loop design standards, the MSM produces unrealistically large distribution areas, thereby modeling only half as many distribution areas as exist in Verizon VA's network today. (VZ-VA Ex. 109 at 28-29.) These frequently oversized serving areas violate basic economic principles and widely-accepted engineering practices and produce understated loop cost estimates that could never sustain the network operations of an efficient carrier in the real world. (VZ-VA Ex. 109 at 28-29.)

The MSM also fails to adhere to Carrier Serving Area standards, which limit the use of copper loops to 12,000 feet beyond the feeder/distribution interface in most areas. By ignoring this standard, the Modified Synthesis Model introduces unnecessary inefficiencies and designs loop plant that is likely to be incapable of supporting the wide range of data services currently available over basic loops (*e.g.*, a modem speed greater than 28.8 kbps, ISDN, and DDS). (VZ-

VA Ex. 109 at 19.) At bottom, these and other modeling flaws result in loop estimates that are substantially understated.

9. AT&T/WorldCom Have Provided No Virginia-Specific Evidence to Justify Adjusting the MSM's Road Factor.

The Modified Synthesis Model's road factor is based upon data that lacks any nexus to Virginia and thus is wholly inappropriate for use in this proceeding. The MSM's road factor, which AT&T/WorldCom reduced from the default value of 1.0 to 0.9, is inappropriately based upon a BellSouth cost model and an order of the Kansas Public Service Commission, neither of which reflect Virginia-specific conditions.^{179/} (AT&T/WCom Ex. 1 at 21-22.) Had AT&T/WorldCom correctly relied upon Virginia-specific data, the road factor would have been increased, not decreased. (VZ-VA Ex. 109 at 104.)

AT&T/WorldCom, however, never conducted an empirical analysis that was Virginia-specific, as Verizon VA witness Mr. Murphy has done (Tr. at 4415), notwithstanding that MSM's own documentation calls for an empirical study of the particular region and specific company when a departure from the default values is proposed. (Tr. at 4414.) Petitioners justify their reduction of the road factor by pointing to an empirical analysis of 14 rural *Kansas* wire centers. Clearly, the results of any such study would have little applicability to a Verizon VA-specific analysis. AT&T/WorldCom go on to claim that their road factor reduction is

^{179/} In addition, the Kansas Order was based on a version of the FCC's Synthesis Model that did not include Mr. Pitkin's coding changes. Because those changes *reduce* the route distances produced by the model, it is all the more inappropriate to apply the road factor reduction in this proceeding based on an analysis of results produced without those changes. (VZ-VA Ex. 108 at 32.)

appropriate because Verizon VA is over lashing^{180/} — an erroneous assumption that allows them to further understate the amount of outside plant required for Verizon VA's network. What AT&T/WorldCom conveniently ignore, however, is that distribution facilities are generally built to specific sizing factors at the time of installation, with no intention of augmentation; only on rare occasions is it necessary to overlay further distribution on an existing route. Furthermore, Mr. Pitkin's claim — that the road factor must be reduced because the MSM's use of surrogate customer location data artificially overstates dispersion (AT&T/WCom Ex. 1 at 21) — has already been considered and rejected by the Commission.^{181/}

Predictably, Mr. Pitkin's reduction of the default distribution road factor in his surrebuttal filing depresses plant investment by more than \$106.7 million and loop cost by \$0.34, as compared to the original Synthesis Model's values. (VZ-VA Ex. 142; VZ-VA Ex. 109 at 103.)

D. AT&T/WorldCom's Approach to Calculating Expense and Support Investment Ratios Systematically Understates UNE Costs.

AT&T/WorldCom's approach to estimating expense and support investment ratios produces systematically understated UNE cost estimates by failing to correct for mismatches between the investments used to develop the ratios and the investment levels to which the ratios are applied.^{182/} AT&T/WorldCom also exclude entire categories of expenses and support

^{180/} Overlashing occurs when a new aerial cable is attached to an existing aerial cable rather than being placed separately on a pole.

^{181/} *Tenth Report and Order* at 20179 ¶ 46 ("In the absence of a reliable source of actual customer locations by which to compare the surrogate locations, it is impossible to substantiate AT&T and MCI's contention that the road surrogate algorithm overstates the dispersion of customer locations in comparison to actual locations.").

^{182/} This issue is addressed throughout Verizon VA's testimony, including VZ-VA Ex. 109 at 10-15 and VZ-VA Ex. 108 at 7-12.

investments from their calculations, which contributes further to the MSM's understatement of TELRIC costs for all UNEs.

1. AT&T/WorldCom's Manipulations of Cost Ratios Produce Unrealistically Low UNE Cost Estimates.

AT&T/WorldCom treat the MSM's cost ratios and data figures as movable pieces, to be mixed and matched until the desired result is produced. AT&T/WorldCom apply current expense-to-booked investment ratios to *forward-looking* investment estimates are unreasonably low for all the reasons discussed earlier) to produce significantly understated expense estimates (e.g., annual expenses to maintain outside plant facilities). What AT&T/WorldCom conveniently fail to recognize is that, unless there is a close match between the investments used to develop the expense-to-investment ratios and the investment levels to which the ratios are applied, the application of such ratios, without appropriate adjustments, will not produce proper results. Indeed, the AT&T/WorldCom approach is the epitome of a mathematical apples-to-oranges mistake and is precisely why, as explained in Part III above, Verizon VA uses a FLC factor to correct for such mismatches. By refusing to make such a correction in their studies, AT&T/WorldCom produce unrealistically low UNE cost estimates.

For example, when calculating plant-specific expenses, the MSM inappropriately applies (1) expense ratios of current expenses to current investments to (2) steeply-discounted, forward-looking investments. As a result, the MSM erroneously links any decrease in plant-specific investment with an automatic, proportionate decrease in on-going expenses.^{183/} This assumption

^{183/} Moreover, the MSM's use of outdated national factors for plant-specific expenses produces unreasonable estimates of Verizon VA's current costs of operating and maintaining its facilities. The use of national averages fails to capture Virginia-specific or Verizon VA-specific operating conditions. (VZ-VA Ex. 108 at 55; VZ-VA Ex. 109 at 77-79.)

simply defies common sense — the maintenance expenses for a \$40,000 car would not suddenly decrease by 25% because the same car is suddenly available on the market for \$30,000.

Likewise, if Verizon obtained larger discounts on switches purchased in the future than it has historically received for the same type of switches, the expense of maintaining those switches would not be reduced proportionately. (Tr. at 3773-80.) While forward-looking expenses may differ from current levels for various reasons, as Verizon VA has recognized, the amount by which expenses will change should reflect reasoned estimates of changes in productivity, inflation, and specifically identifiable cost saving measures, not merely the reduction in the purchase price of various plant assets. AT&T/WorldCom refuse to perform this detailed analysis and instead rely on the MSM to formulaically reduce expenses in tandem with investments.

Similarly, when calculating general support, the MSM applies the ratio of book investment in general support assets to total book plant investment to the MSM's unreasonably low estimate of forward-looking total plant investment. This produces a significantly understated estimate for the general support assets. The ratio of the book cost of a support asset to the total book network cost is unlikely to be the same as the corresponding ratio for forward-looking costs, because, for example, expenses may stay stable even if prices for equipment decline over time.^{184/} For instance, the price of central office switches, in the ratio denominator, has declined over time (although not as much as the Modified Synthesis Model suggests), but the

^{184/} The Commission itself recognized that booked investment should be converted to current investment in calculating general support expenses. *See Tenth Report and Order* at 20338-39 ¶ 415. However, as described in section III above, the solution suggested there — application of a current-to-book ratio to adjust the value of booked investment — is only a partial solution to the mismatch.

cost of land and buildings, in the ratio numerator, has not.^{185/} Therefore, applying a ratio of booked land and building costs to booked switching investment to forward-looking switching investment would produce too low a value for forward-looking land and building costs.^{186/}

AT&T/WorldCom's calculation of corporate operations expenses suffers from the same flaw. When calculating corporate operations expenses, the MSM applies an 8% factor to a base of expenses that is inconsistent with the base from which the 8% factor was developed and thereby overstates efficiencies for the corporate operations expenses that have already been accounted for in the base to which the factor is being applied. (VZ-VA Ex. 109 at 75-76.) As a result, the MSM produces less than one-third of Verizon's corporate expenses in 2000. (VZ-VA Ex. 108 at 35.) Indeed, the \$45 million in corporate overhead produced by the MSM is well under one-half of Mr. Pitkin's own projections of Verizon VA corporate overhead expenses. (AT&T/WCom Ex. 23, Attachment E.)

In addition, when calculating network operations expenses, the MSM utilizes inaccurate forecasts of Verizon VA-specific 2002 expenses and access lines and 1998 national level regression results to develop per-unit values that are assigned to individual UNEs. Mr. Pitkin offers no explanation to support the claim that the use of forecasted 2002 network operations expense and demand data are consistent, or even appropriate, for use with the Modified Synthesis Model's other expense factors, most of which are of 1998 nationwide vintage. Nor does he identify what adjustment, if any, he makes to account for the discrepancy. This flawed

^{185/} Notably, current investments for general support assets, including land and building, have been increasing relative to book cost. (VZ-VA Ex. 109 at 81-82.)

^{186/} As the Commission has recognized, the MSM also omits land investment required to support general support structures (*e.g.*, garages and operation centers). (VZ-VA Ex. 109 at 112.) *See also Tenth Report and Order* at 20340 ¶ 417.

approach substantially exaggerates demand growth, thereby distorting any relationship between demand and expense and significantly understating network operations expenses. Moreover, Mr. Pitkin's response on surrebuttal to Dr. Tardiff's criticism — that the MSM does not assign the full amount of network operations expenses to each individual UNE — falls short. (VZ-VA Ex. 108 at 61.) Despite Mr. Pitkin's purported "correction," the MSM still fails to assign \$13 million of the \$106 million total to network elements. (VZ-VA Ex. 108 at 18.)

2. The Modified Synthesis Model Fails To Include Entire Categories of Expenses.

AT&T/WorldCom's self-serving manipulation of the MSM's expense and investment ratios is exacerbated by the wholesale omission of entire categories of expenses. Without explanation, AT&T/WorldCom chose to omit essential investments and expenses from their UNE cost estimates. For example, when calculating common support services expense, AT&T/WorldCom exclude the ARMIS account for marketing altogether, even though Mr. Pitkin conceded on cross-examination that some of the expenses *were* UNE-related. (Tr. at 3859-63.) Without conducting any analysis, Mr. Pitkin simply eliminated a number of legitimate, forward-looking marketing costs that are associated with the provision of UNEs (*e.g.*, product forecasting, product management, and regulatory implementation). (Tr. at 3859-63.) Consistent with AT&T/WorldCom's other decisions, this unjustified omission results in unrealistic and understated cost estimates.^{187/}

Similarly, when calculating general support costs, AT&T/WorldCom exclude general support costs for special access and toll services, apparently on the mistaken assumption that,

¹⁸⁷ The Modified Synthesis Model also fails to included the cost of local number portability based on the ludicrous assumption that a CLEC's ability to purchase individual UNEs means that the ILEC will no longer incur such costs. (VZ-VA Ex. 109 at 75.)